

What is claimed is:

1. A separator for non-aqueous electrolyte secondary battery, wherein the separator comprises a shut-down layer, a heat-resistant microporous layer, and a spacer having a form of particles, fibers, net or porous film on the surface of the heat-resistant microporous layer.
2. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the heat-resistant microporous layer consists of a heat-resistant resin.
3. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the spacer comprises an electrochemically stable substance.
4. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the electrochemically stable substance is an electrochemically stable organic polymer, or an electrochemically stable organic polymer containing an electrochemically stable inorganic compound.
5. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the spacer has a form of particles and a particle diameter of 3 μm or less.
6. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the static friction coefficient between the spacer-disposed separator surface and a stainless steel surface ground by a 1000 grit polishing paper

is 0.5 or less.

7. The separator for non-aqueous electrolyte secondary battery according to claim 1, wherein the spacer is formed by coating an application liquid containing an electrochemically stable substance on the surface of the heat-resistant microporous layer.

8. The separator for non-aqueous electrolyte secondary battery according to claim 6, wherein the application liquid is a suspension.

9. The separator for non-aqueous electrolyte secondary battery according to claim 3 or 4, wherein the electrochemically stable substance is an organic polymer selected from the group consisting of a polyolefin, a polyolefin copolymer, a fluorine-containing polymer, a polycarbonate, an aromatic polyester, a polyethylene terephthalate and a cellulose.

10. A non-aqueous electrolyte secondary battery including the separator for non-aqueous electrolyte battery according to any one of claims 1 to 9.

11. The non-aqueous electrolyte secondary battery according to claim 10, wherein the spacer is adjacent to a cathode.